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Potlatch

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11/5/07

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RE: Updated Tier I Renewal Application
Lumber Drying Division

Per your request, we have updated the Potlatch Forest Products Corporation (PFPC) Lumber Drying Division's (LDD's) Tier I Permit Renewal application to address your questions regarding the facility's lumber drying kilns. These revised pages present kiln throughput and emission rate information that is consistent with the facility's original Tier II Permit application. PFPC has not made any changes to the facility that would affect the LDD's kilns, lumber drying process, maximum throughput rates, or potential to emit since the original Tier II Permit application.
As previously acknowledged by our consultants at Geomatrix, Table 3-5 of the June 2007 Tier I renewal application erroneously cited the throughput potential for a new kiln we recently permitted at the St. Maries Complex rather than the throughput for the older kilns at the Lumber Drying Division. The attached tables correct that error and update the emissions associated with the kilns to reflect the correct potential lumber throughput. In addition, we have inserted a discussion of the potential kiln throughput based on available wood species and the short-term species-specific kiln throughput. This issue was discussed in depth four years ago, and is repeated at your request.

These updated pages of the application should replace the pages in the June 2007 Tier I Permit application.

I hereby certify that based on information and belief formed after reasonable inquiry, the statements and information contained in this and any attached and/or referenced document(s) are true, accurate, and complete in accordance with IDAPA 58.01.01.123-124.
Sincerely,

Greg Cooperrider

Greg Cooperrider

Manager – St. Maries Complex

w/enclosures (6 pages)

3.0 EMISSION SOURCES AND ESTIMATES

This section addresses Facility emissions of criteria pollutants and HAPs (as defined by IDAPA 58.01.01.006.81) and TAPs (defined by IDAPA 58.01.01.585 and 586).

The existing Tier I permit aggregates emission sources at the Facility into three emission units:

- EU3: Hurst boiler
- EU4: Dry kilns (four)
- EU5: Oil and edge seal process (no longer located at the Lumber Drying Division)

Table 3-1 summarizes stack parameters for the boiler and dry kilns. Table 3-2 summarizes facility-wide potential emissions of criteria air pollutants. Additional detail is available in the following sections and in the forms provided in Appendix B.

TABLE 3-1. POINT EMISSION SOURCES AND PARAMETERS

Source Identification Number	Associated Building	Stack Height (ft)	Stack Diameter (ft)	Exhaust Temperature (F)	Exhaust Exit Velocity (acfm)	Exhaust Type
Dry Kiln Vents (14 per kiln)	Kilns	23.6	21"x21"	180	1,456/kiln	Vertical
Hurst Boiler	Boiler	50	3.16	450	22,000	Vertical

Note: Each of the 14 vents per kiln is a 21"x21" square. Seven alternatively serve as inlets, then as outlets. Approximately 208 acfm passes through each vent.

TABLE 3-2. CRITERIA POLLUTANT POTENTIAL TO EMIT

	NOx		CO		SO2		PM10		VOC	
	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Kilns	-	-	-	-	-	-	0.93	4.1	19.79	86.7
Hurst Boiler	8.4	36.7	6.5	28.6	0.2	0.7	5.7	25.1	0.1	0.4
Total	**8.4**	**36.7**	**6.5**	**28.6**	**0.2**	**0.7**	**6.63**	**29.2**	**19.89**	**87.1**

3.1 HURST BOILER

The wood fired Hurst boiler is rated at 34,500 pounds of steam per hour (approximately 49 million Btu/hr). The boiler provides steam heat to the four kilns used to dry lumber. PM emissions from the boiler are controlled by a multiclone and an electrostatic precipitator (ESP). The multiclone, installed with the boiler in 1987, removes larger particulate matter from the exhaust stream. Particulate matter emissions are further filtered by a McGill Air Clean Intercept Model 2-75 ESP, installed in 2002. Criteria pollutant emissions from the Hurst Boiler are listed in **Table 3-3.** Hourly emissions are based on the maximum firing rate; annual emissions are based on the maximum hourly emissions for 8,760 hours.

TABLE 3-3. ESTIMATED HURST BOILER CRITERIA POLLUTANT EMISSIONS

Pollutant	Potential to Emit (lb/hr)	Potential to Emit (tons/year)
NOx[a]	8.4	36.7
CO[b]	6.5	28.6
SO2[a]	0.16	0.7
PM-10[a]	5.7	25.1
VOC[b]	0.08	0.4

a - Emission rates from August 4, 2004 source test. Test conducted while boiler at maximum steaming rate and both TR sets operating.

b - Emission rates from 1994 source test. Although CO and VOC were measured during the August 2004 test, the results were not valid. The CO testing equipment was damaged in transit to the test and the VOC results were nullified by IDEQ after the test completion.

The Hurst boiler also emits chemical compounds deemed toxic air pollutants (TAPs) by IDAPA 58.01.01.586 and hazardous air pollutants (HAPs) under CAA section 112(b). Table 3-4 identifies emission factors and TAP/HAP emissions associated with the Hurst boiler.

TABLE 3-4. ESTIMATED BOILER TAP/HAP POTENTIAL EMISSIONS

Pollutant	Emission Factor[a] (lb/MMBtu)	Potential to Emit (lb/hr)	Potential to Emit (tons/year)	CAS No.	HAP?
Acetaldehyde	1.64E-04	8.03E-03	3.52E-02	75-07-0	Yes
Acetone	2.15E-04	1.05E-02	4.61E-02	67-64-1	
Acetophenone	3.23E-09	1.58E-07	6.92E-07	98-86-2	Yes
Acrolein	3.15E-05	1.55E-03	6.77E-03	107-02-8	Yes
Antimony	2.29E-05	1.12E-03	4.91E-03	7440-36-0	Yes
Arsenic	5.62E-06	2.75E-04	1.21E-03	7440-38-2	Yes
Barium	3.47E-04	1.70E-02	7.45E-02	7440-39-3	
Benzene	7.42E-04	3.64E-02	1.59E-01	71-43-2	Yes
Beryllium	1.55E-06	7.60E-05	3.33E-04	7440-41-7	Yes
Bis(2-ethylhexyl)phthalate	4.65E-08	2.28E-06	9.98E-06	117-81-7	Yes
Bromomethane	2.80E-05	1.37E-03	6.01E-03	74-83-9	Yes
Butanone-2 (MEK)	5.39E-06	2.64E-04	1.16E-03	78-93-3	
Cadmium	2.90E-06	1.42E-04	6.23E-04	7440-43-9	Yes
Carbon Tetrachloride	4.54E-05	2.22E-03	9.74E-03	56-23-5	Yes
Chlorine	7.92E-04	3.88E-02	1.70E-01	7782-50-5	Yes
Chlorobenzene	3.32E-05	1.63E-03	7.13E-03	108-90-7	Yes
Chloroform	2.75E-05	1.35E-03	5.91E-03	67-66-3	Yes
Chloromethane	2.31E-05	1.13E-03	4.96E-03	74-87-3	Yes
Chlorophenol-2	3.37E-08	1.65E-06	7.24E-06	108-43-0	
Chromium, hexavalent	1.75E-07	8.59E-06	3.76E-05	18540-29-9	
Chromium, trivalent	1.54E-06	7.53E-05	3.30E-04	7440-47-3	Yes
Cobalt	1.25E-07	6.13E-06	2.68E-05	7440-48-4	Yes
Copper	7.44E-06	3.65E-04	1.60E-03	7440-50-8	
Crotonaldehyde	9.91E-06	4.86E-04	2.13E-03	4170-30-3	
Dibromoethene-12	5.48E-05	2.69E-03	1.18E-02	106-93-4	Yes
Dichloroethane-12	2.92E-05	1.43E-03	6.27E-03	107-06-2	Yes
Dichloromethane	2.87E-04	1.41E-02	6.16E-02	75-09-2	Yes
Dichloropropane-12	3.33E-05	1.63E-03	7.15E-03	78-87-5	Yes
Dinitrophenol-24	9.33E-08	4.57E-06	2.00E-05	51-28-5	Yes
Ethylbenzene	3.13E-05	1.53E-03	6.72E-03	100-41-4	Yes
Formaldehyde	1.72E-03	8.42E-02	3.69E-01	50-00-0	Yes
Hydrogen chloride	3.50E-03	1.72E-01	7.51E-01	7647-01-0	Yes
Lead	4.95E-05	2.42E-03	1.06E-02	7439-92-1	Yes
Manganese	9.81E-05	4.81E-03	2.11E-02	7439-96-5	Yes
Mercury	4.16E-07	2.04E-05	8.92E-05	7439-97-6	Yes
Methanol	8.30E-04	4.07E-02	1.78E-01	67-56-1	Yes
Molybdenum	2.07E-06	1.01E-04	4.43E-04	7439-98-7	
Naphthalene	9.46E-05	4.63E-03	2.03E-02	91-20-3	Yes
Nickel	2.53E-06	1.24E-04	5.42E-04	7440-02-0	Yes
Nitrophenol-4	1.71E-07	8.39E-06	3.68E-05	100-02-7	Yes
Nitrous Oxide (N2O)	1.33E-02	6.53E-01	2.86E+00	10024-97-2	
Pentachlorophenol	2.27E-08	1.11E-06	4.87E-06	87-86-5	Yes
Phenol	1.25E-05	6.14E-04	2.69E-03	108-95-2	Yes
Phosphorus	3.54E-05	1.73E-03	7.60E-03	7723-14-0	Yes

Pollutant	Emission Factor[a] (lb/MMBtu)	Potential to Emit (lb/hr)	Potential to Emit (tons/year)	CAS No.	HAP?
PAH	1.80E-08	8.84E-07	3.87E-06	PAH	
Propionaldehyde	6.11E-05	2.99E-03	1.31E-02	123-38-6	Yes
Selenium	1.74E-06	8.54E-05	3.74E-04	7782-49-2	Yes
Silver	1.74E-03	8.50E-02	3.72E-01	7440-22-4	
Styrene	1.86E-03	9.11E-02	3.99E-01	100-42-5	Yes
Sulfuric Acid	1.18E-02	5.76E-01	2.52E+00	7664-93-9	
TCDD-Total	2.05E-10	1.00E-08	4.39E-08	1746-01-6	Yes
Tetrachloroethene	3.82E-05	1.87E-03	8.21E-03	127-18-4	Yes
Tin	6.63E-06	3.25E-04	1.42E-03	7440-31-5	
Toluene	2.13E-05	1.04E-03	4.56E-03	108-88-3	Yes
Trichloroethane-111	3.07E-05	1.51E-03	6.60E-03	79-00-5	Yes
Trichloroethene	3.03E-05	1.49E-03	6.51E-03	79-01-6	Yes
Trichlorophenol-246	1.14E-08	5.56E-07	2.44E-06	88-06-2	Yes
Vanadium	1.36E-06	6.66E-05	2.92E-04	1314-62-1	
Vinyl Chloride	1.84E-05	9.02E-04	3.95E-03	75-01-4	Yes
Xylene-o	2.45E-05	1.20E-03	5.25E-03	1330-20-7	Yes
Yttrium	3.01E-07	1.48E-05	6.47E-05	7440-65-5	
Zinc	2.32E-04	1.14E-02	4.98E-02	7440-66-6	
Total HAPs	-	**5.28E-01**	**2.31**		

(a) Emission factor from AP-42 Section 1.6, Table 1.6-3 adjusted for electrostatic precipitator emission control.

3.2 LUMBER DRYING KILNS

The four Coe/Moore lumber drying kilns were built in 1987. Each kiln has a series of vents that allow air to be drawn into the kiln, heated, and exhausted through other vents. The vents open and close automatically as the lumber is dried.

Air pollutant emissions from dry kilns depend on the species of wood dried and the throughput of the kilns. The Lumber Drying Division's kilns' maximum annual throughput is 102 million board feet per year (MMBF) as presented in Table 3-5. The kilns' throughput will not exceed this level due to the mix of the available timber resources that are within a financially viable geographic distance of the facility. The facility's actual kiln throughput rates are much lower than the maximum throughput.

TABLE 3-5. POTENTIAL KILN THROUGHPUT

Tree Species	Average Hours per Charge	Average bf per Charge	mbf per Day (4 Kilns)[a]	Anticipated Composite Annual Wood Mix	
				Species Mix	Maximum Annual Throughput[b]
Grand Fir, Hemlock	61	150,000	236	42.9%	102 mmbf/yr
Douglas Fir/Larch	62	150,000	232	30.1%	
Engelmann Spruce/ Lodgepole Pine	37	150,000	389	10.7%	
Western Red Cedar	24	102,000	408	16.3%	

a – The production rates presented in this column are based on the assumption PFPC dries only one species of wood for a day.
b – The annual production rate presented here is the kilns' maximum throughput while drying the LDD's typical species composition.

Table 3-6 summarizes emission factors for pollutants emitted from lumber dry kilns. Most emission factors are derived from small scale kiln studies.

TABLE 3-6. DRY KILN EMISSION FACTORS

Species	Pollutant					
	PM10 (lb/mbf)	VOC (lb/mbf)	Acetaldehyde (lb/mbf)	Formaldehyde (lb/mbf)	Methanol (lb/mbf)	Phenol (lb/mbf)
Grand Fir, Hemlock	0.05[a]	0.20[b]	0.0461[b]	0.00004[b]	0.1743[b]	0.0011[b]
Douglas Fir/Larch	0.02[a]	0.49[c]	-	0.001[c]	0.023[c]	0.004[d]
Engelmann Spruce, Lodgepole Pine	0.08[e]	1.7[f]	-	0.004[f]	0.060[f]	-
Western Red Cedar	-	0.12[g]	-	-	-	-

Notes:
a- Emissions from Oregon Department of Environmental Quality, June 2003 emission factor document.
b- Emissions from May 2005 small scale lumber kiln tests conducted for Potlatch at Oregon State University, Corvallis, Oregon (OSU)
c- Emission from Douglas Fir, September 2000 OSU report.
d- Emissions provided by Olympic Region Clean Air Authority, Olympia, Washington (ORCAA) for Douglas fir
e- Based on pine emission factor of 0.08 lb/mbf obtained from National Council for Air and Stream Improvement, Eugene, Oregon (NCASI)
f- Based on pine, AP-42 Draft Section 10, December 1993.
g- Based on NCASI, provided by David Word
- (dash) indicates no emission factor available.

Calculated PM10 and VOC emission rates are listed in **Table 3-7** by applying the highest pollutant-specific emission factor from Table 3-6, regardless of species, to the facility's maximum annual throughput, 102 MMBF. The maximum PM10 and VOC emission factors are associated with drying Engelmann Spruce, Lodgepole Pine (ESLP). In practice, however, ESLP accounts for only 10-15 percent of the annual production, so applying the ESLP emission factors to the kilns' maximum throughput rate overestimates the kilns' potential to emit. The kilns' conservative emission rate values are included in the facility-wide emission inventory presented in Table 3-2.

TABLE 3-7. PM10 AND VOC POTENTIAL TO EMIT, TOTAL FOR ALL KILNS

	PM10		VOC	
	(lb/hr)	(tons/year)	(lb/hr)	(tons/year)
Four Dry Kilns[a]	0.93	4.1	19.79	86.7

a – To be conservative, the emission rates presented are based on the kilns' maximum annual throughput (102 MMBF/year) and the highest pollutant-specific emission factor applicable to the Lumber Drying Division.

Kilns also emit chemical compounds deemed TAPs by IDAPA 58.01.01.585-586 and hazardous air pollutants (HAPs) under CAA section 112(b). Table 3-8 identifies TAP and HAP emissions associated with the lumber drying kilns.

TABLE 3-8. KILN TAP/HAP POTENTIAL EMISSIONS, TOTAL FOR ALL KILNS

Species	Pollutant							
	Acetaldehyde		Formaldehyde		Methanol		Phenol	
	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Four Dry Kilns[a]	0.54	2.35	0.05	0.20	2.03	8.89	0.05	0.20

a – To be conservative, the emission rates presented are based on the kilns' maximum annual throughput (102 MMBF/year) and the highest pollutant-specific emission factor applicable to the Lumber Drying Division.

3.3 OIL AND EDGE SEAL PROCESS

The oil and edge seal process, listed in the current Tier I permit as EU5, no longer exists at the Lumber Drying Division. The oil and edge seal process equipment was moved from the St. Maries Lumber Drying Division in 2006. Emissions and regulations relating to this process are now obsolete, and PFPC requests that DEQ remove EU5 from the re-issued Tier I permit.

3.4 PROCESS FUGITIVE EMISSIONS

Various fugitive PM10 sources exist at the Lumber Drying Division, including paved and unpaved roads. The PM10 emissions from these sources are insignificant.

3.5 INSIGNIFICANT SOURCES

Activities and emission units identified as insignificant under IDAPA 58.01.01.317.01(b) are required to be listed in a Tier I operating permit to qualify for a permit shield. These are listed in Appendix C.